

SPECIES AND AREAS UNDER PROTECTION: CHALLENGES AND OPPORTUNITIES FOR THE CANADIAN NORTHERN CORRIDOR

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EXECUTIVE SUMMARY

The Canadian Northern Corridor (CNC) is a proposed multimodal transportation right-of-way, with accompanying infrastructure, that would run largely through northern Canada, with the goal of connecting all three coasts. Given the magnitude of the project, there are many implications for the lands and waterways, as well as for humans and other species in those areas, that the CNC will either intersect directly or affect indirectly through cascading effects.

This study used literature searches focused on the intersection of biodiversity, conservation research, government policies and engagement with Indigenous knowledge systems. Given the diversity of topics and the amount of research available in some areas (e.g., entire reviews have been written solely focused on the ecological effects of roads), this study highlights, rather than comprehensively treats, potential biodiversity challenges associated with the CNC. Biodiversity is a term that refers to the diversity (variability or complexity) of life, typically at one or more of the following levels: genes, species and ecosystem. Major development projects may: 1) reduce genetic diversity within species, 2) increase odds of species loss in the region, and 3) degrade the quality and extent of a variety of ecosystems.

Wetlands will be an important consideration for the CNC project. Wetlands are a globally threatened ecosystem, disappearing at roughly three times the rate as forests. Canada is known as a significant reservoir of fresh water, holding approximately 20 percent of the world's freshwater supply. Relevant to the CNC, more than half of this water drains northward into the Arctic Ocean and Hudson Bay. The dominant habitat that the CNC will traverse is the boreal forest, which holds 25 percent of the world's wetlands and 85 percent of Canada's wetlands. Geographical regions of concern are northern Ontario and northern Manitoba. The specific risks to wetlands from the CNC project include habitat loss and habitat fragmentation, which creates smaller populations isolated from other populations, leading to reduced probability of persistence through time, ultimately reducing biodiversity. Given their reliance on wetlands for breeding and early life development, amphibians may also be negatively impacted. Globally, amphibians are the most threatened vertebrates, mitigated somewhat by the fact that presently only two at-risk amphibian species have ranges projected to overlap with the CNC.

Connecting Canada's three coasts, and especially increasing traffic to three ports in the Arctic Ocean, carries with it the significant risk of increased opportunities for the invasion

and spread of exotic (i.e., non-native) species. Globally, exotic species are recognized to be one of the main threats to native biodiversity, through their ability to introduce disease, prey on native species and compete for space, food and other resources. One major threat to the North would be via oceanic shipping from Atlantic and Pacific regions. Over land, increased traffic from southern locales, including the USA, would also pose a significant risk.

A critical potential negative impact of the CNC will be the suite of direct and indirect effects on plants and wildlife of roads, railways, powerlines, pipelines, culverts and bridges: direct mortality from collisions, reductions in movement associated with avoiding or having trouble crossing linear features (e.g., pipelines), and reductions in amount and quality of habitat. Mitigating these effects will be challenging because, for example, there is evidence that not only are different major groups of species differentially represented in vehicle collisions, but these rates can also differ significantly among closely related species. For impacts on movement patterns, there is evidence for contributions of sex, age and life history stage (e.g., juvenile vs. adult) of individuals. Finally, there are various road-related features that further degrade adjacent habitats, including noise, light and contaminant pollution. Powerlines and pipelines present the risk of electrocution and oil spills, respectively. Powerline cutlines may also be dominated by exotic plant species and lead to increased encounters between predators and prey, such as wolves and caribou.

The goal of the CNC is to better connect Canada's North and near-North regions to the rest of the country. However, in doing so, it runs the risk of reducing the total extent of roadless areas. A recent analysis of this issue concluded that Canada has a global responsibility to maintain and manage roadless areas, pointing out that keeping regions largely devoid of roads is one of the most effective ways to achieve our biodiversity-protection and climate-change commitments.

A related concern is a phenomenon dubbed “growth-inducing infrastructure”—namely, the tendency for an initial development to be the catalyst for additional non-incremental and transformative changes to the surrounding environment. For example, creating a cutline for a powerline may lead to the development of mines using the local and cheap electricity, which subsequently leads to increased logging and other activities. Similarly, a highway creates a need for gas stations, restaurants and lodging, which make legal and illicit hunting and angling more viable. The existence of a major corridor will also encourage connecting existing roads to the CNC, further reducing the extent of roadless areas.

Canada has a series of acts and regulations in place at federal, provincial and territorial levels to identify and protect species at risk of extinction, create wildlife areas for the preservation of wildlife, and assess and mitigate the environmental impacts of development projects. Through the process of searching the literature, I primarily encountered three federal Acts, although there are others relevant to the CNC, notably the *Migratory Birds Convention Act* and the *Fisheries Act*. The *Canada Wildlife Act (CWA 2017)* oversees the creation, management and protection of areas for wildlife research activities and conservation. Working together with the *Species at Risk Act (SARA 2002)*, *CWA 2017* protects habitats critical for the long-term persistence of species, especially those that are considered at risk. Although the proposed CNC route does not look to intersect with many Migratory Bird Sanctuaries or National Wildlife Areas, one notable area for consideration will be Edézhzié Protected Area in the Dehcho region of the Northwest Territories. Established

in partnership between the Dehcho First Nations and the Government of Canada in 2018, it is noted for its great ecological, cultural and spiritual significance. The mandate of *SARA 2002* is to prevent the loss of wildlife species, guide the recovery of species that are locally extinct or at risk of being so and manage species of concern before their status further worsens. With reference to lists of species at risk for the various provinces and territories, I highlight seventy-nine at-risk wildlife species (primarily birds, mammals and fish) with ranges that potentially intersect with the CNC. Some of the more well-known species include the boreal caribou, polar bear, peregrine falcon, whooping crane and bull trout. A complication for the protection of species at risk in Canada is that *SARA 2002* provisions apply only to federally owned lands. Additionally, an independent assessment found that the federal government, provinces and territories are consistently underperforming in their obligations to protect species at risk. I recommend that CNC proponents treat such provisions as minimum but incomplete and go beyond them through engaging with local communities and Indigenous Peoples. Finally, the *Impact Assessment Act (IAA 2019)* is a federal process for assessing the potential impacts and preventing significant negative environmental effects of major projects. Given its scope and extent, the CNC will likely be a “designated activity,” meaning that it will be subject to the *IAA 2019* five-phase process, which includes significant engagement with Indigenous Peoples and knowledge.

Indeed, authentic engagement and partnerships with Indigenous Peoples will be needed for all aspects of the CNC project to be a success, including biodiversity conservation and protection. Insights from Western science and Indigenous knowledge need to be treated as equally valid. In some areas, the two will be well aligned, whereas more dialogue will be needed in other instances. The former may apply in the case of preserving and protecting boreal caribou, whereas the latter is more likely with the tendency for Western science to prioritize areas based on various metrics (e.g., total evolutionary history present among the species in a region), which is not prevalent among Indigenous perspectives on biodiversity. Following the success of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound, I advocate the creation of an oversight scientific panel with strong representation from Elders and Knowledge Keepers as well as Western science practitioners.

While the proposed CNC presents a significant number of challenges for biodiversity conservation and preservation in Canada’s North and near North, there are some potential opportunities. First, the CNC project will create opportunity and need to minimize wildlife-vehicle collisions and maintain connections between previously contiguous habitat patches. There is a very large amount of literature that can inform the correct use of fencing and wildlife crossings (e.g., highway overpasses); if utilized well, this evidence-based approach could yield additional insights and establish the CNC as a standard for similar projects. Second, it will create opportunities to monitor species and ecosystems. While it is hard to quantify the extent of data deficiency for species, watersheds in the North and near North appear overrepresented among those in Canada that are poorly monitored. Third, the development of the CNC potentially opens many avenues for research in the North, including insights into how best to mitigate effects of multimodal corridors on biodiversity. For example, additional research could be conducted on the efficacy of specialized overpasses in minimizing impacts on bats, with existing efforts to date largely based in Europe. Finally, two interrelated major opportunities are that of improving Canada’s poor record of action towards protecting biodiversity at all levels of government and suggesting revisions to various legislation, such as *IAA 2019* processes.